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The management of anaemia in patients discharged from critical care

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Abstract

Anaemia is common in critically ill patients, affecting 60–80% of patients during admission to critical care, and 75% of patients at critical care discharge.¹ Allogeneic red blood cell (RBC) transfusion in intensive care (ICU) has declined in recent years with the widespread adoption of evidence-based restrictive transfusion practice and the use of single-unit transfusions. The prevalence of anaemia at discharge from ICU is likely to have increased as a result, but data on the management of anaemia following discharge from critical care are sparse. Our objectives were:

1. To identify the prevalence of anaemia at ICU and hospital discharge.
2. To evaluate allogeneic RBC transfusion in patients discharged from ICU benchmarked against local and national guidelines.

Oxford University Hospitals (OUH) NHS Trust guidelines for use of blood components in adult haematology patients state that RBC transfusions “should only be considered for patients with a haemoglobin (Hb) $<80 \text{ g L}^{-1}$, unless otherwise clinically indicated.” The Choosing Wisely Campaign² from the US recommends a restrictive transfusion threshold (70 to 80 g L^{-1}) in stable patients without evidence of inadequate tissue oxygenation.

Data were collected retrospectively for all adult patients admitted to the two general adult ICUs of the OUH Trust from 1 December 2014 to 31 January 2015. Patients admitted to specialist ICUs, e.g. cardiac, neuro-intensive care, were excluded.

A total of 206 (male = 115, female = 92) patients were admitted during the study period. The mean (SD) age was 59.7 (17.5) years. A total of 144 (70%) patients were anaemic on admission to ICU. The mean (SD) Hbs for specific time points were: ICU admission – 116 (21.4) g L^{-1} ; ICU discharge – 107 (66) g L^{-1} ; hospital discharge Hb – 107 (18.8) g L^{-1} .

Of the 184 patients that survived to ICU discharge, 179 (97%) were anaemic; 42/179 (23%) of anaemic patients received ≥ 1 allogeneic RBC transfusion while on the ward. One patient activated the major haemorrhage protocol. Table 1 describes the characteristics of this group. There were no significant differences in age, APACHEII scores and ICU discharge Hb between non-bleeding patients who were transfused at higher thresholds ($>80 \text{ g L}^{-1}$) compared to those transfused at lower thresholds ($<70\text{--}80 \text{ g L}^{-1}$). Data on the relative prevalence of ischaemic heart disease, which

Table 1. Characteristics of patients who received RBC transfusion post-ICU discharge.

Age, mean (SD) years	59.9 (17.1) years
Gender	
Male (n)	23/42
Female (n)	19/42
Ward	
Medical (n)	15/42
Surgical (n)	27/42
Hb (g L^{-1})	
ICU admission, mean (SD)	106 (20.9) ^a
ICU discharge, mean (SD)	88 (13.4) ^a
Hospital discharge, mean (SD)	101 (14.8) ^a
Transfusion threshold (g L^{-1})	
Mean (SD)	80.3 (13.3)
Median	78
Pre-transfusion Hb range	5.3–10.1
No. (%) transfused if Hb < 70	7 (16.8%)
No. (%) transfused if Hb 70–80	16 (38%)
No. (%) transfused if Hb 80–90	13 (31%)
No. (%) transfused if Hb 90–100	3 (7.1%)
No. (%) transfused if Hb > 100	3 (7.1%)
Allogeneic units transfused	
Mean (SD)	2.71 (2.28)
Median	2
Range	1–10

^a $p < 0.05$ when compared to post-ICU group who didn't receive a RBC transfusion.

could have impacted transfusion thresholds, were not collected.

A total of 169 patients survived to hospital discharge. Of these, 138 (81%) were anaemic; 53 patients were discharged with an Hb of $<100 \text{ g L}^{-1}$ with no mention of follow-up or investigation for anaemia in the immediate discharge summary.

Anaemia is associated with increased morbidity, fatigue and poor quality of life.³ We have shown a very high prevalence of anaemia in previously critically ill patients at the time of hospital discharge. Rather worryingly, we found no documented follow-up plan for investigation and management of anaemia in this cohort, even those with more severe anaemia (defined as $\text{Hb} < 100 \text{ g L}^{-1}$). There appears to be widespread variation in the ward-based transfusion thresholds used in critically ill patients discharged to the ward. Further work is needed to improve adherence to transfusion policies and to develop guidelines for investigation and management of anaemia at hospital discharge.

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Through the eyes of the patient: Surviving the intensive care unit, extracorporeal membrane oxygenation and beyond

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Abstract

This case history describes my experience as a patient with acute respiratory failure and sepsis in the hospital where I worked as clinical lead for cancer. My learning through 82 days of critical illness aims to increase awareness and build on current improvements in ICU clinical practice and follow-up.

I was admitted to my hospital with a community-acquired streptococcal pneumonia in February 2014. Within hours, I had deteriorated and was transferred to ICU to be mechanically ventilated before being transferred to the specialist centre for veno-venous extracorporeal membrane oxygenation (ECMO) due to worsening respiratory failure and infection. I remained on ECMO for 32 days with complications. After seven weeks, I returned to my local ICU for respiratory weaning and rehabilitation for severe muscle wasting and profound weakness. I was discharged home in May 2014 but was readmitted within 24 h and received treatment for post-ICU delirium.

A year later, I am the outcome of many right decisions being made at the right time from GP referral through to my admission to medical assessment unit (MAU) and rapid transfer to ICU, followed by referral to the specialist centre which included joint working with the palliative care service and referral to rehabilitation and psychological services.

The patient and nurse in me had a lot of time to consider my predicament as I watched daily life in a high-tech environment, while dependent for my every need. Both staff who cared for me and colleagues have asked what they could learn from my experience:

- One. Both conscious and unconscious, I could see and hear what was happening around me, but it was my interpretation of the communication and sounds and the impact of my surroundings that made that experience unique to me.
- Two. From cutting-edge treatments to my most basic care, it was the demonstration of patience and perseverance to get to the root of problems both through the acute phase of my illness and during rehabilitation to recovery, which

quantified the meaning of compassion and dignity in critical care.

Three. ICU follow-up met my fundamental need to make sense of what had happened to me. Reassurance was not gained solely by having one to one care or receiving clinical explanation but by also having access to psychological support on different levels.

Four. Centralisation of specialist services has sparked controversy but the ability, willingness and speed of two hospitals and different clinical specialties to work together on my behalf saved my life.

For the staff in ICU, there is a huge pressure to get it right. Possible triggers for my reactions as a patient, knowing what helped and hindered me and some practical solutions are suggested to support ICU teams to help the patient and carer survive critical illness and rehabilitation to recovery.

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Focussed echocardiography in intensive care – A completed audit cycle implementing a standardised reporting tool

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Abstract

The ability to perform a focussed echocardiogram in intensive care is becoming a vital tool for intensivists managing critically ill patients. The focussed intensive care echocardiography (FICE) programme has been in place for the last five years in the UK, and there are now many FICE-accredited doctors and allied health professionals working on ICUs across the country, with 286 UK FICE mentors registered with the intensive care society.¹ Guidance on how to report FICE revolves around answering six key questions via a limited range of scans, but there is limited literature available on how FICE changes the management of patients. Additionally, it is unknown how easily intensivists can move towards a focussed echocardiogram becoming a seamless part of clinical bedside evaluation of patients rather than a departmental investigation. Robust governance of the process of mentorship and referral is also important, and recently has been suggested to be a minimum of biannually.² Milton Keynes University Hospital Department of Critical Care is a nine-bedded general adult ICU, with nine intensive care consultants, five of whom are FICE accredited, and two tiers of junior doctors with variable training and experience in echocardiography, with backup from a

consultant cardiologist with experience in critical care. The department has a Phillips Sparq ultrasound machine for its sole use.

An initial audit was performed by examining the electronic records of the ultrasound machine and identifying the number of trans-thoracic echocardiograms performed over a six-month period. A standardised reporting tool was introduced (a stamp) in February 2015, and a further six months of FICE-accredited scans had data prospectively gathered.

In period 1 (1 August 2014–1 February 2015), 114 echocardiograms were performed in 76 patients; 58 of these scans were performed by doctors training for FICE or CEM competencies, six were performed by cardiologists, 39 were performed by FICE-accredited doctors and 11 did not have the operator documented. Of the 39 accredited scans, there were both a lack of reporting and also variability in the quality of reports. In period 2 (1 February 2015–1 August 2015), 127 scans were performed in 51 patients. Seventy-six of these were training scans, one was by a cardiologist, 35 were by FICE-accredited doctors and five were by unknown operators (not documented). Of the 35 FICE scans in this period, all had documentation using the standardised reporting tool, and 19 (54%) had a change in management instituted following the scan – predominantly administration of a fluid bolus, but other therapies instituted included vasopressors, inotropes, pericardiocentesis and thrombolysis.

The standardised reporting tool was well received and used in all accredited scans following its introduction. The tool improves documentation of focussed echocardiograms on our ICU and allows for easier data collection. Moreover, FICE scans in a DGH are feasible and result in management change in more than half of the patients scanned.

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Clinical audit of the transition from the intensive care unit to palliative care on the ward

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Abstract

Following the withdrawal of life-sustaining treatment, palliative patients may be transferred from ICU to a ward, with potential for dissettlement to both patient and relatives. Such transfers present challenges to care and coordination necessitating effective interprofessional communication and should be carried out with compassion and clinical efficiency to maintain patient dignity and comfort and avoid distress to relatives. An important consideration is the conversion from intravenous analgesia to the subcutaneous (SC) route manageable on the ward.

Although there has been some recent investigation into transfers, both of non-palliative patients from ICU to wards¹ and other ICUs,² and palliative patients from ICU to home,³ transferring palliative patients from ICU to wards remains poorly explored in the literature; thus, guidance for safe transfer is limited.

This audit investigates the efficacy of transition from Addenbrooke's ICU to palliative care on a ward, assessing whether patient comfort is maintained through considered prescription of analgesia, and whether appropriate communication is made with relatives. Addenbrooke's ICU is a 20-bed tertiary adult unit within a teaching hospital, with a complex case mix of medical, surgical and specialist transplant patients.

Data were collected retrospectively over one month and prospectively over four months. All 13 patients who qualified for inclusion during the collection period were included in the audit. Seven standards were assessed; three related to communication with the patients' relatives and four to the conversion from intravenous to SC analgesia. Analysis of the results showed none met the 100% target compliance, with performance significantly worse for standards concerning communication with relatives than for standards concerning analgesic conversion (Table 1), with higher rates of compliance achieved

Table 1. Compliance for each standard.

Standard	Target % (based on standard)	Number in sample	Number and % of cases complying	Number and % of cases not complying	Exceptions
1. Relatives aware that patient may be transferred to a ward	100	13	7 (54)	6 (46)	1 – sister requested no involvement
2. Relatives aware that medications will be transferred to a different route	100	13	3 (23)	10 (77)	1 as above
3. Relatives aware of potential for patient dissettlement over this period of conversion	100	13	1 (7)	12 (92)	1 as above
4. Appropriate conversion of opioid to SC route prior to transfer out of ICU	100	13	12 (92)	1 (7)	Nil
5. Appropriate calculation of opioid dosing prior to transfer	100	13	9 (69)	4 (31)	Nil
6. Contact made with palliative care team prior to transfer	100	13	9 (69)	4 (31)	Nil
7. Conversion of current opioid to SC alfentanil in a CSCI and/or oxycodone PRN if patient has renal failure	100	8	6 (75)	2 (25)	Nil

in all standards when palliative care were contacted. To achieve best practice, a computerised checklist of the standards was devised for use during transfer. In addition, it is planned to produce an explanatory leaflet for relatives.

This audit demonstrates the importance of a holistic multidisciplinary approach to transferring palliative patients from ICU to a ward, achieved by early contact with palliative care, considered conversion to SC analgesia and communication with relatives prior to transfer. Although the audit relates to transfers at Addenbrooke's, it is widely applicable as the need to carry out transfers with expertise is common to all ICUs. Establishing a framework for transfers is therefore vital, particularly considering the possibility of these transfers increasing in frequency. Consequently, our results should prove relevant and readily transferrable to other ICUs.

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South Yorkshire Airway Assistant Course (SYAAC): Can a dedicated regional course for nursing staff improve airway safety on the intensive care unit?

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Abstract

Rapid sequence induction (RSI) for the ICU patient is one of the highest risk interventions that we perform,¹ yet in most units our airway assistants receive no formal training. In June 2013, we conducted a local audit project on a medium-sized district hospital ICU focusing on the highly important role of the ICU nurse during RSI within the critical care environment.² Initial results demonstrated low levels of confidence and knowledge, and it became apparent that no formal training structure was in place to educate and prepare nurses for this high-risk intervention. We implemented a local teaching package comprising a mix of theory and simulation followed by a re-audit. We demonstrated significant improvements in all areas.

Such was the positive feedback, we took the decision to develop a regional airway course to address this training issue.

South Yorkshire Airway Assistant Course (SYAAC) is an intensive regional critical care airway course designed specifically for the requirements of ICU nursing staff. Run by a committed multidisciplinary faculty, the aim is to provide nurses with the knowledge, confidence and skill to competently assist with RSI as members of a critical care airway team. The course begins with a series of tailored lectures providing candidates with a solid working knowledge of all aspects of high-risk RSI within the critical care environment. Topics covered include: the origins of RSI and the various modifications that maybe implemented, detailed information regarding drugs, optimization strategies utilised prior to induction and a lecture centred on the complications that may arise following induction. The afternoon proceeds with multiple small group teaching sessions. Faculty members receive detailed blue prints in advance to ensure a standardised approach is delivered throughout. Sessions include: simulation exercises, a cricoid pressure 'master-class' and the final session is a dedicated airway equipment workshop. Candidates then sit a multiple choice question (MCQ) paper under exam conditions followed by a simulation test.

The first intake of candidates passed both the MCQ and simulation test at the first attempt achieving average scores of 80% and 93%, respectively. Candidates are asked to complete pre- and post-course questionnaires

to facilitate audit. For the first intake, overall confidence improved dramatically with an average pre-course score of 4.2/10 increasing to 8.7/10 following the course. Knowledge relating to airway equipment and drugs showed similar increases. Thus far, the course has been delivered twice with a third date set for the Autumn. We have been delighted to receive excellent feedback across the board, and it is clear that demand for the course is increasing significantly.

We conclude that SYAAC is an effective training tool in the preparation of ICU nurses for their important role as members of the critical care airway team. We hope this will translate into improved clinical safety as increasing numbers of nursing staff successfully complete this tailored training process.

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